

**Savannah River Site
Solid Waste Management Department
Consolidated Incinerator Facility
Operator Training Program**

**CONSOLIDATED INCINERATOR FACILITY (CIF)
AUTHORIZATION BASIS TRAINING (SAFETY
ANALYSIS REPORT (SAR) / TECHNICAL SAFETY
REQUIREMENTS (TSR)) (U)
Study Guide**

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REVISION LOG

REV.	AFFECTED SECTION(S)	SUMMARY OF CHANGE
0	All	Initial issue

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REFERENCES

1. WSRC-TR-95-0315, *Technical Safety Requirements, Savannah River Site, Consolidated Incineration Facility*, February, 1995
2. Hazardous Waste Permit, *Permit No. SC1 890 008 989*, South Carolina DHEC, Department of Health and Environmental Control, Office of Environmental Quality Control, Bureau of Solid and Hazardous Waste Management, November 2, 1992
3. DOE 5480.23, *Nuclear Safety Analysis Reports*, 04/10/92
4. DOE 5480.22, *Technical Safety Requirements*, 2/25/92
5. DOE 5480.21, *Unreviewed Safety Questions*, 12/24/91
6. WSRC-SA-17, *Safety Analysis Report - 200 H-Area, Savannah River Site, Consolidated Incineration Facility*, DOE Approval Copy, February 1995
7. WSRC-RP-94-546, *Authorization Basis Documents for SWMD*, Rev. 3, December 1995
8. SWE-CIF-94-0030, *Functional Classification Document, Consolidated Incinerator Facility*, July 1994
9. S-EHA-H-00001, *Emergency Preparedness Hazards Assessment for the Consolidated Incinerator Facility (U)*, Rev. 0, January, 1995

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LEARNING OBJECTIVES

TERMINAL OBJECTIVE

- 1.00 Given course of instruction and applicable procedures and reference materials, **DEMONSTRATE** understanding of the Authorization Basis documents used at the Consolidated Incinerator Facility.

ENABLING LEARNING OBJECTIVES

- 1.01 **STATE** the purpose of the Authorization Basis documents for the CIF.
- 1.02 **DESCRIBE** the design basis considerations for the CIF.
- 1.03 **IDENTIFY** the documents included in the authorization basis for the CIF.
- 1.04 Given a material identified as an airborne hazard, **DESCRIBE** the following:
- a. Associated barriers
 - b. Mitigative features
 - c. Administrative controls
- 1.05 **IDENTIFY** the functional classifications to include:
- a. Criteria associated with the classifications
 - b. CIF systems classifications
- 1.06 Given a SAR Implementation Document as a reference, **DESCRIBE** the following portions included in the document:
- a. Sequential parameter number for the identified requirement
 - b. Source document title, number, and page
 - c. Facility segment
 - d. Cognizant Authority for associated system, structure or component
 - e. Affected system
 - f. Description of the parameter
 - g. Implementing document(s)
- 1.07 **IDENTIFY** how applicability applies to TSRs for the following two criteria:
- a. Facility Operational Modes
 - b. Process Areas

LEARNING OBJECTIVES (Cont.)

- 1.08 **DEFINE** the following terms:
- a. Safety Limits
 - b. Limiting Conditions for Operations
 - c. Surveillance Requirements
- 1.09 **DESCRIBE** the following administrative controls of the CIF TSRs:
- a. Minimum Shift Crew Composition
 - b. Procedures Applicability and Usage
 - c. Inventory Control Program
 - d. Occurrence Reporting
 - e. Facility Operations Safety Committee
 - f. Facility Operating Records
- 1.10 **DESCRIBE** the Auditable Safety Analysis (ASA) to be used at CIF.

INTRODUCTION TO THE CIF AUTHORIZATION BASIS

Introduction

1.01	STATE the purpose of the Authorization Basis documents for the CIF.
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This section addresses the primary safety documents that make up an Authorization Basis which will ensure the safe operation of the Consolidated Incineration Facility. The safety is for ourselves, our co-workers and the public. Authorization Basis documents are derived from Department of Energy guidelines and orders. Authorization Basis documents are implemented by lower-tier procedures and documents, which contain limits on variables and system operations that are at least as restrictive as those in the Authorization Basis documents.

Authorization bases are those aspects of the facility design basis and operational requirements relied upon by the Department Of Energy (DOE) to authorize operation. Those aspects are considered to be important to the safety of the facility operations. The safety envelope of the CIF depends on the control of the inventory of radioactive and hazardous materials in each segment of the CIF below levels that could, if dispersion occurred, give a dose of more than 4 rem to the maximally exposed individual. This value was chosen to provide a margin of safety below that specified in the WSRC Procedure Manual 9Q.

CIF Design Basis

1.02	DESCRIBE the design basis considerations for the CIF.
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Design basis criteria is the set of minimum requirements that bound the design of systems, structures, and components within a facility. These design requirements include: safety considerations, plant availability, efficiency, reliability, operability, and maintainability. Some aspects of the design basis are important to safety while others aspects are not. However, these minimum requirements ensure that the CIF can be operated without undue risk to the health and safety of the employees, public, and the environment. The following items represent the principal design criteria for the CIF:

- The design life of the CIF will be 30 years. The design should include consideration for eventual facility decommissioning.
- The project was originally designed to meet the design requirements of Du Pont and the DOE Orders in effect at the time of project initiation. During the design process, the project criteria were changed to meet the intent of current DOE Orders and Regulations.
- All structures in this facility are designed in accordance with Site Specification No. 7096 Revision 3, using loads for “Intermediate Resistance Building Class” and the 1988 Uniform Building Code (UBC) for Seismic Zone 2A (safety factor = 1.25).
- CIF processing standards are designed to meet the requirements of Subsection 9.J of DOE Order 5480.11, “Radiation Protection for Operational Workers.”

- For contamination control, Radiologically Controlled Area (RCA) exhaust will be passed through High-Efficiency Particulate Air (HEPA) filters and isokinetically sampled in accordance with the requirements of American National Standards Institute (ANSI) N13.1-1969, American National Standards for Sampling Airborne Radioactive Material in Nuclear Facilities and ANSI N42.18-1980, Specifications and Performance of Onsite Instrumentation for Continuously Monitoring Radioactivity in Effluents. The design of the building ventilation system meets the following requirements:
 - The environmental, safety, and health aspects of DOE Order 6430.1A
 - DOE Order 5480.11, Subsection 9J
 - WSRC-IM-92-43, Process Ventilation Guide
 - ERDA-76-21, Nuclear Air Cleaning Handbook
- Facility radiation shielding will be provided to attenuate radiation levels such that exposure to operating personnel will not exceed 1 rem/yr to the whole body as described in DOE Order 6430.1A. Radiation doses to personnel will be kept As Low As Reasonably Achievable (ALARA). To accomplish this, working dose rates are to be limited to 0.5 mrem/hr for areas of constant occupancy and 5 mrem/hr for areas occupied less than 10% of the time.

Liquid and solid wastes generated as process byproducts will be confined, treated, and ultimately transferred to other onsite facilities for further treatment and/or storage.

CIF Authorization Basis Documents

1.03	IDENTIFY the documents included in the authorization basis for the CIF.
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The Authorization Basis documents are the primary safety control documents. The bounds in the Authorization Basis are summarized in documents such as the facility Safety Analysis Report (SAR) and other safety analyses, Hazard Classification Documents, Technical Safety Requirements, DOE-issued Safety Evaluation reports, and facility-specific commitments made in order to comply with DOE Orders or policies. The CIF has its own Authorization Basis which relies heavily upon documents already in existence. Table 1, *CIF Authorization Basis Documents*, identifies these documents by item, type, number and title.

Item	Document Type	Document Number	Document Title
1A	DOE approved Safety Analysis Report (SAR)	WSRC-SA-17, Rev. 0, Feb. 1995	Safety Analysis Report, Consolidated Incinerator Facility
1B	DOE approved Generic Safety Analysis Report (GSAR)	<ul style="list-style-type: none"> • WSRC-RP-91-188, Aug. 1994 • G-SAR-G-0011, Oct. 1994 • G-SAR-G-0012, Oct. 1994 • G-SAR-G-0014, Feb. 1995 • G-SAR-G-0015, Nov. 1994 • G-SAR-G-0017, Oct. 1994 	<i>Various</i>
2	DOE approved Operational Safety Requirements (OSR) or Technical Safety Requirements (TSR)	WSRC-TR-0315, Rev. 0, Feb. 1995	Technical Safety Requirements, Consolidated Incinerator Facility
9	Pending SAR changes (Unreviewed Safety Questions (USQs))	<i>Various</i>	<i>Various</i>
10	Facility Functional Classification	SWE-CIF-94-0030, July 1994	Preliminary Functional Classification Document, Consolidated Incinerator Facility
11	Emergency Preparedness Hazards Assessment Documents	S-EHA-H-00001, Jan. 1995	<i>Various</i>

Table 1, CIF Authorization Basis Documents

The USQ documents are not actually authorization basis documents, they merely serve as notification of pending changes to the SAR. Items 10 and 11, the functional classification and the hazard assessment documents, are not authorization basis documents but important references supporting or related to the authorization basis.

Figure 1, *Consolidated Incinerator Facility Authorization Basis Hierarchy*, shows the documents arranged in pyramid form to represent the order of significance.

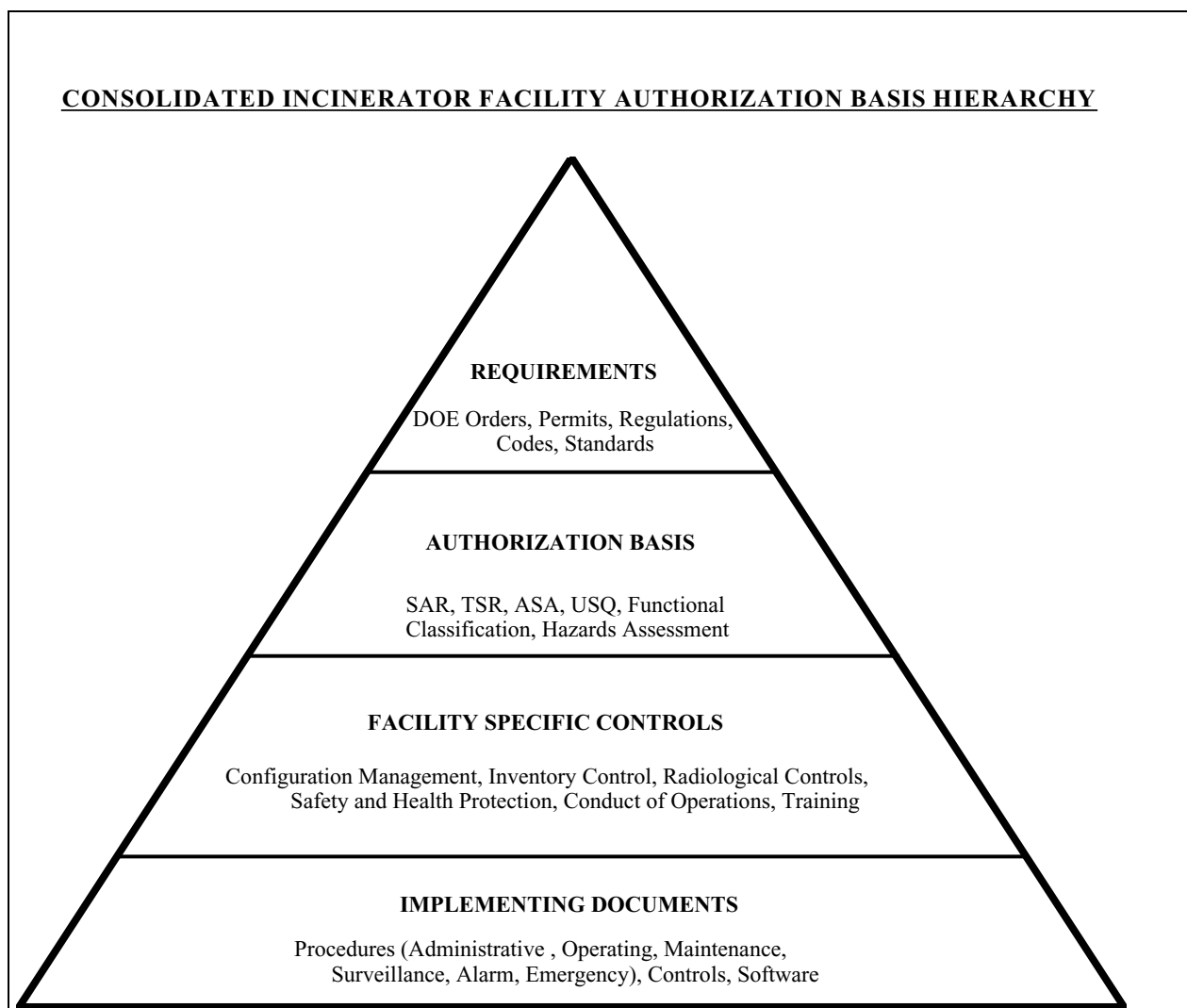


Figure 1, Consolidated Incinerator Facility Authorization Basis Hierarchy

DOE Orders 5480.22 and 5480.23

The purpose of the two orders are to specify the requirements for the development of SARs (5480.23) and TSRs (5480.22) for DOE nuclear facilities. The outline, content, material and implementation requirements for the documents are spelled out in detail by these two documents.

S-EHA-H-00001, Emergency Preparedness Hazards Assessment Document

- 1.04** Given a material identified as an airborne hazard, **DESCRIBE** the following:
- a. Associated barriers
 - b. Mitigative features
 - c. Administrative controls

The Emergency Preparedness Hazards Assessment (EPHA) provides the technical basis for facility emergency planning efforts. The document differs from the other facility safety documentation (e.g. SAR, Hazard Assessment Document (HAD)) which use a risk/probability assessment approach concerning potential accidents. The EPHA uses data associated with the airborne hazard potential of the facility chemical and radiological inventories. If a material presents an airborne hazard, a detailed characterization and barrier identification process is applied. Event scenarios are designed to include potential for release, release mechanisms, durations, initiation, and source term calculations. From the scenarios, assessments are performed to develop emergency actions and plans. Based upon the event indications, and hazard classifications, a facility Emergency Plan Implementing Procedure (EPIP) is written to describe facility personnel responses, event classifications and recommended protective actions.

The first thing the EPHA does is to screen out all materials that do not present airborne hazards. The remaining materials are identified and a description of barriers, mitigative features, and administrative controls are identified. Table 2, *Ash Handling Barriers*, is an example of the barrier identification of the EPHA.

Material	Description of Barriers	Description of Mitigative Features	Description of Administrative Controls
Chemical HCl, SO ₂ , CO, NO _x	<ol style="list-style-type: none"> 1. Ash Tank 2. Physical Form of Wet Ash 3. Ash Drum 4. Ashcrete Cement Matrix 	<ol style="list-style-type: none"> 1. HVAC System on ash room 2. Standby diesel generators 3. Pressure relief door on backhoe 4. Tank low water level interlock 5. Tank vent to quench vessel 6. Backhoe/knife gate interlock 	<ol style="list-style-type: none"> 1. pH monitoring/control of ash tank water 2. Corrosion inspections of the ash tank 3. QA/QC of drums 4. Ability to pump spilled water to blowdown tanks
Radionuclide Cs-137, Pu-239	<ol style="list-style-type: none"> 1. Ash Tank 2. Physical Form of Wet Ash 3. Ash Drum 4. Ashcrete Cement Matrix 	<ol style="list-style-type: none"> 1. HVAC System on ash room 2. Standby diesel generators 3. Pressure relief door on backhoe 4. Tank low water level interlock 5. Tank vent to quench vessel 6. Backhoe/knife gate interlock 	<ol style="list-style-type: none"> 1. pH monitoring/control of ash tank water 2. Corrosion inspections of the ash tank 3. QA/QC of drums 4. Spray wash of ash chute/knife gate 5. Spray wash of ashcrete drums 6. HP contamination control procedures on drums 7. Ability to pump spilled water to blowdown tanks

Table 2, Ash Handling Barriers

After the barriers are assigned, the EPAH discusses accident analyses. The barrier analyses, the results of releases of airborne contaminants, and the designation of the releases are discussed. The designations are discussed and defined in the document appendices.

After the analyses of the releases are discussed, the document addresses the assessment of the consequences of the releases. Ratios are developed for the amount of radioactivity released based upon the following:

- scenario release designation
- projected dose at 30 meters (m), 100 m and the nearest site boundary (11,270 m)
- maximum distance from release to a dose equal to the Protective Action Criteria (PAC)
- probable event classification
- time required to reach PAC maximum distance at 95% adverse wind speed (1.7 m/sec)

The EPHA then discusses the emergency classes and action levels required for event analyses. The emergency classes are identified (in order of severity) as General Emergency (GE), Site Area Emergency (SAE), Alert, and Notification of Unusual Events (NoUE). If an identified event has the potential to cause the release of hazardous materials resulting in consequences greater than or equal to the PAC at identified locations, then an Emergency Action Level (EAL) is required.

Primary release mechanisms for radionuclides are fires, a combination of container ruptures, and releases from chemical spills. The primary release mechanisms at CIF are ruptures of containers (storage vessels, transport vessels), vent piping, and transfer piping.

Finally, the EPHA addresses the determination of the Emergency Planning Zone (EPZ). The EPZ is defined as an area within which special planning and preparedness efforts are warranted as a means of apportioning emergency preparedness resources. Based upon analyses and evaluations, the CIF EPZ is the general site boundary.

Functional Classifications

- | | |
|-------------|---|
| 1.05 | IDENTIFY the functional classifications to include: <ul style="list-style-type: none">a. Criteria associated with the classificationsb. CIF systems classifications |
|-------------|---|

CIF systems, structures and components are assigned functional classifications based upon the hazards assessment documents. There are four types of functional classifications. In order of severity, they are as follows:

- NS (Nuclear Safety) - applicable to systems necessary for protection of public from radiological consequences; category based upon assessment of exposure risk, operating conditions and accident conditions
- CP (Critical Protection) - applicable to systems required for protection of public from exposure to non-radiological hazardous materials or radiological hazards; category based upon calculated exposure risk and potential for criticality from accident analyses in the SAR or hazard assessment documents.

- PS (Production Support) - systems necessary to support continued operation of a nuclear production facility, including environmental monitors and emergency communication devices; PS classification is further determined by three criteria:
 - any system whose failure would result in monetary loss > \$1 million or a loss of production time > 6 months
 - any on-line monitor required for direct measure of releases to the atmosphere, ground water or surface water regulated by an environmental permit or requirement
 - any system required by the emergency plan for environmental monitoring or for communication with local, state and federal government agencies
- General Service - any system that is not classified as NS, CP or PS

Based upon the hazards assessment documents, NS and CP classifications are not applicable to CIF. The hazards analysis showed that the potential only exists for localized consequences if the waste inventories in the facility are released. As a result, the inventory of hazardous and radioactive wastes stored and subsequently incinerated will be maintained at a level to permit the facility to be classified as a hazard category 3.

Operational Safety Requirements (OSRs) contain limits on the maximum radiological inventories acceptable in the wastes to be incinerated. The OSR limits are maintained at levels to prevent any releases from exceeding the Risk Assessment Guidelines of 5 rem on-site (employee at 100 meters from the release point) and 0.5 rem off-site (a maximally exposed individual off-site). OSRs limit the inventory so that a release would result in an on-site dose of less than 4 rem (less than 5 rem at 100 meters).

Of the 48 identified systems at CIF, 6 are functionally classified as PS. They are SAAM (both gas and radioactive monitoring), Induced Draft Fans, DCS, Standby Diesel Generator and Fuel Oil, and the UPS. The other 42 systems are functionally classified as GS.

Unreviewed Safety Questions (USQs)

USQs allow facilities the flexibility to make physical and procedural changes to a facility without prior DOE approval as long as the changes do not affect facility authorization basis or TSRs. USQs will be discussed further in the TSR section of this text.

SAFETY ANALYSIS REPORT

Introduction

The SAR currently being used for the CIF is WSRC-SA-17, Safety Analysis Report - 200 H-Area, Savannah River Site, Consolidated Incineration Facility, DOE Review Draft, December 1993. A Safety Analysis is a documented process: (1) to provide systematic identification of hazards within a given DOE operation; (2) to describe and analyze the adequacy of measures taken to eliminate, control, or mitigate identified hazards; and (3) to analyze and evaluate potential accidents and their associated risks. The SAR documents that the various processes and equipment used in the final design of the CIF can be operated in compliance with all applicable laws and regulations as well as without undue risk to onsite or offsite populations or to the environment.

Chapter 1 - Introduction and General Description of the Facility

This chapter provides the purpose and goals, location, scope of activity, and the potential impacts and benefits of facility operation. Additionally, it also discusses the site characteristics and location, design criteria of the facility, description of the various areas in the facility, waste disposal and environmental control, safety and protection, service utilities, and a general description of the process.

Chapter 2 - Summary Safety Analysis

This section addresses site analysis, impacts of normal operations, impacts of abnormal operations, impacts of accidents, and conclusions of the impacts for both radiological and non-radiological events.

Chapter 3 - Site Characteristics

The section provides a description of the site by references. It describes the geology (land formations), topography (map descriptions), hydrology (water systems and structures), and provides drawings of the site and areas. Another important aspect covered in this section is the measurement and direction of prevailing winds (important factor to consider with regards to contamination and emissions control).

Chapter 4 - Principal Design Criteria

This section describes the accident analyses for all potentially credible events and the consequences. This describes the Design Basis Events used when preparing the safety analyses and the design of the facility.

Chapter 5 - Facility Design

This section provides some general information regarding the design characteristics of the facility. It discusses both the hardware (kiln, scrubber, tanks, pumps, etc.) and the software (control schemes, waste processing, etc.). Facility design standards were set up to exceed both industry and regulatory requirements. All designs were reviewed and approved by both DOE and South Carolina Department of Health and Environmental Control (SCDHEC). The design took into account the intent of the facility as well as the desire to protect the public, protect employees, limit accident potential and limit damage to equipment.

Chapter 6 - Process Systems

This section discusses the main process and associated auxiliary systems used in the facility for the handling and processing of the waste and fuels. In addition, this section also covers safety analysis considerations for nuclear criticality, fire safety, chemical safety, shutdown modes, instrumentation, and effluent monitoring.

Chapter 7 - Waste Confinement and Management

This section describes how the facility will not only control emissions and effluents, but also how the facility will control waste inventories before they are processed. It mentions waste management policies, applicable laws and permit regulations, waste stream classifications, treatment, storage operations and packaging.

Chapter 8 - Facility Safety Programs

This section describes the facility safety programs for personnel and equipment. Items covered include radiation protection, fire safety, criticality safety, industrial safety, and industrial hygiene.

Chapter 9 - Analysis of Operation

This section provides a description of all operations associated with the processing of waste at the facility. It also describes the characteristics of the wastes and fuels to be processed. The section also discusses the management controls in place for operation of the facility. The section identifies hazard scenarios and controls, impacts of normal and abnormal operations, and discusses failure modes and results for identified systems. It also addresses the impacts of accidents such as explosions, fires, criticality, low energy liquid release, and natural phenomena.

Chapter 10 - Conduct of Operation

This section identifies the organizational structures and hierarchies, the acceptance and testing program and requirements, the training program and normal operations.

Chapter 11 - Derivation of Technical Safety Requirements

This section discusses how the TSRs were developed and the guidelines for their evaluation. It identifies some credible events due to analyses of operations, the derivation of the facility operational modes, derivation of the TSRs based upon events and modes, design features and interfaces to other facilities.

Chapter 12 - Quality Assurance

This section parallels existing portions of the 1Q Manual.

Chapter 13 - Emergency Preparedness

This section provides a facility description, a description of accidents, classification and notification of accidents, responsibilities, emergency response measures, emergency response equipment and measures, maintenance of emergency preparedness capability, records and reports, recovery, and compliance with the Community Right-To-Know Act.

Chapter 14 - Decontamination and Decommissioning

This section identifies how the facility will be handled when it is permanently shut down after thirty years. Some of the options are to lock it up, dismantlement, delayed dismantlement (wait until any contamination has decayed to safe levels before attempting to dismantle), and entombment (not a likely option).

Chapter 15 - Glossary

This section provides definitions, acronyms, and abbreviations for commonly used terms in the SAR.

Chapter 16 - Human Factors

This section discusses human factors processes, man-machine interfaces, design factors to optimize interfaces, evaluations and conclusions used in the design and operational processes.

SAR Implementation Matrix

1.06	Given a SAR Implementation Document as a reference, DESCRIBE the following portions included in the document: <ol style="list-style-type: none">Sequential parameter number for the identified requirementSource document title, number, and pageFacility segmentCognizant Authority for associated system, structure or componentAffected systemDescription of the parameterImplementing document(s)
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The SAR Implementation Matrix identifies all requirements to be upheld to ensure compliance with the Safety Authorization Basis. The requirements are captured in procedures or administrative guidelines. The matrix identifies the following items:

- Sequential parameter number for the identified requirement
- Source document title, number, and page
- Facility segment
- Responsible Cognizant Authority for associated system, structure or component
- Affected system
- Description of the parameter
- Implementing document(s)

Figure 2, *SAR Implementation Matrix*, shows a representation of a typical parameter.

Parameter Number: 3	Source Doc. No.: WSRC-SA-17	Pg.: 9.3 - 10
Facility Segment(s): 1	Source Doc. Title: CIF SAR, Chapter 9, Analysis of Operations	
Responsible Eng: E. A. Brown	Source Doc. Change Req.: N	
Affected System(s): Ram Feed and Gate System		
Parameter Description: Air purge system is continually monitored for flow and has a low-flow alarm. System is interlocked to shut down incinerator upon low flow.		
Implementing document(s): Ram Feed enclosure low-flow alarm #SWF-6261FA set at 200 scfm and will alert the operator if total purge air flow to the Box Pusher and Ram Feed is low. Alarm also has input to permissive for feeding solid waste.		

Figure 2, SAR Implementation Matrix

NOTE: Implementation matrix documents are presently being revised for identification of Process Requirements (PRs) and associated implementation documents.

New revisions the matrix will also identify how the process requirement was determined and classified. There are three classifications used: Safety Assumption (SA), Design Basis Process (DB-P), and Design Basis General (DB-G). Subsequent revisions will be made to this material when the designation process is completed.

The facility Technical Safety Requirements (TSRs) are also upheld by a similar implementation matrix. This matrix is identical in appearance and is also undergoing changes associated with the identification of PRs.

TECHNICAL SAFETY REQUIREMENTS

Introduction And Scope

Technical Safety Requirements Applicability

Technical Safety Requirements (TSRs) were written for the Consolidated Incineration Facility (CIF) at the Savannah River Site (SRS). The CIF consists of a process building (Building 261-H) and a tank farm (Building 262-H). The process building contains the rotary kiln, secondary combustion chamber, and related support equipment, as well as the solid waste handling and incinerator feed systems. The tank farm contains the liquid waste, fuel oil, and propane storage and incinerator feed systems and includes the Organic Waste Transfer Line (OWTL) from the Defense Waste Processing Facility (DWPF). The CIF is designed to reduce the volume of hazardous, mixed, and radioactive wastes generated onsite. The TSRs are applicable to the operation and maintenance of the CIF.

Preparation of TSRs

The TSR document was prepared in accordance with guidance contained in Department of Energy (DOE) Order 5480.22, "Technical Safety Requirements," and proposed DOE-STD-3005- YR, "Evaluation Guidelines for Accident Analysis and Safety Structures, Systems, and Components," dated February 25, 1994. In addition, commercial nuclear industry guidance and experience have been applied where appropriate. The development of the TSR is described in Chapter 11 of the CIF Safety Analysis Report (SAR).

The content and format of the TSR document are as follows:

- **SECTION 1 - Use and Application** - Section 1 contains basic information and instructions for using and applying the TSRs. The following elements are addressed under separate headings: Introduction and Scope, Definitions, MODES, and PROCESS AREA Description.
- **SECTION 2 - Safety Limits** - Section 2 contains Safety Limits (SLs) on process variables associated with the physical barriers, generally passive, that are necessary to guard against the uncontrolled release of radioactivity and other hazardous MATERIALS. The SLs describe the actions to be taken when the limit is exceeded.
- **SECTION 3/4 - Limiting Control Settings, Limiting Conditions for Operation, and Surveillance Requirements** - Section 3/4 contains specific Limiting Control Settings (LCSs), Limiting Conditions for Operation (LCOs), and Surveillance Requirements (SRs) applicable to the FACILITY. The LCSs and LCOs describe the actions to be taken when the particular limit is exceeded.
- **SECTION 5 - Administrative Controls** - Section 5 contains the administrative and management controls necessary to ensure safe operation of the FACILITY within the context of this TSR.

- APPENDIX A - Bases - Appendix A provides for each TSR a Bases that explains the background and applicability for the SL, LCS, and/or LCO (including SRs and their frequencies), as well as the importance of the individual requirement to safety.

Definitions

FACILITY	The entire process and related support equipment necessary to carry out the mission of the CIF. FACILITY boundaries and activities are described in the CIF SAR.
FACILITY SEGMENT	In the accident analysis, the CIF was analyzed as three FACILITY SEGMENTS. FACILITY SEGMENT 1 is the process building (Building 261-H) and includes the incineration system, as well as the box handling (with reject storage), ashout, ashcrete/blowcrete storage, and process offgas areas. FACILITY SEGMENT 2 is the tank farm (Building 262-H), which includes all liquid waste (in a variety of containers) unloaded in the tank farm and the radioactive organic waste (in the OWTL) from DWPF. FACILITY SEGMENT 3 consists solely of the isolated 500-gallon propane tank located north of the tank farm.
MATERIAL	Low-level radioactive, hazardous, and mixed (containing both hazardous and radioactive components) waste.
MODE	The status or operating condition of a FACILITY or PROCESS AREA in the CIF.
PROCESS AREA	A defined area in the FACILITY that may consist of a tank, system, portion of a system, room, portion of a room, building, or portion of a building. Each PROCESS AREA forms part of a FACILITY SEGMENT.
RESPONSE PLAN	A plan that is developed and implemented to restore the FACILITY or PROCESS AREA into TSR compliance. The philosophy and content of RESPONSE PLANS are outlined in the Administrative Controls Section of the TSR.

Modes

- 1.07 IDENTIFY** how applicability applies to TSRs for the following two criteria:
- a. Facility Operational Modes
 - b. Process Areas

The mission of the CIF is centered around the operation of the incineration system; therefore, the operational MODES are tied to this system. The incineration system burns liquid and solid low-level radioactive, hazardous, and mixed waste generated at other SRS facilities. The incineration system contains a fuel oil-fired combustion chamber, or kiln. As a result of operating permit restrictions, liquid and solid waste can only be fed to the incineration system when process parameters are at the values required to achieve and maintain a Destruction and Removal Efficiency (DRE) of 99.99%. The combination of process parameters (including the minimum waste introduction temperature) required to achieve the 99.99% DRE will be determined during the trial burn performed prior to the introduction of any low-level radioactive, hazardous, or mixed waste.

Based on the operation of the incineration system, with subsystems such as the tank farm and box handling area operated in accordance with FACILITY procedures to support incineration system operation, the following operational MODES are defined for the CIF.

OPERATION	A MODE in which the FACILITY is capable of performing its intended function. The CIF incineration system is allowed to receive solid and/or liquid MATERIAL. The fuel oil burners are on, and the incineration system is above minimum temperature for incineration.
WARM STANDBY	A MODE in which the mission of the FACILITY is not actively being performed. The CIF incineration system is not allowed to receive solid or liquid MATERIAL, but still retains its inventory of MATERIAL. The fuel oil burners and/or propane igniters are on due to the FACILITY transitioning either to the OPERATION MODE or the SHUTDOWN MODE.
SHUTDOWN	A MODE in which the FACILITY is not operating. The CIF incineration system is not allowed to receive solid or liquid wastes, but still retains its inventory of MATERIAL. The fuel oil burners and propane igniters are off. System temperatures are decreasing or at ambient.

COLD STANDBY A MODE in which the FACILITY is not operating. The CIF incineration system is not allowed to receive solid or liquid wastes. The major part of the MATERIAL inventory has been removed from the incineration system as a result of normal kiln rotation in the SHUTDOWN MODE. The fuel oil burners and propane igniters are off. System temperatures are at ambient.

NOTE: As far as a MATERIAL inventory is concerned, subsystems such as the tank farm and box handling area are unaffected by the MODES of the FACILITY, which are defined in terms of the incineration system. The tank farm and box handling area can receive waste with the FACILITY in any MODE as long as the specified inventory limits are adhered to.

Process Area Description

For the purposes of the CIF TSR, the term PROCESS AREA refers to any defined area within the FACILITY. Examples of PROCESS AREAS are a tank in the tank farm, the tank farm itself, and the box handling area in the main process building. Each PROCESS AREA forms part of a FACILITY SEGMENT.

In the accident analysis, the CIF was analyzed as three FACILITY SEGMENTS. FACILITY SEGMENT 1 is the process building (Building 261-H) and includes the incineration system, as well as the box handling (with reject storage), ashout, ashcrete/blowcrete storage, and process offgas areas. FACILITY SEGMENT 2 is the tank farm (Building 262-H), which includes all liquid waste (in a variety of containers) unloaded in the tank farm and the radioactive organic waste (in the OWTL) from the DWPF. FACILITY SEGMENT 3 consists solely of the isolated 500-gallon propane tank located north of the tank farm.

SECTION 2 - Safety Limits

- 1.08** **DEFINE** the following terms:
- a. Safety Limits
 - b. Limiting Conditions for Operations
 - c. Surveillance Requirements

Safety Limits (SLs) are limits on important process variables that directly protect the integrity of those barriers that are necessary for preventing the uncontrolled release of radioactive or other hazardous MATERIALS. SLs are the bounds within which the measurable operational parameters (temperature, pressure, flow, etc.) must be maintained for the safe and adequate control of the process operations. SLs are not to be exceeded in order to protect the integrity of the physical systems designed to guard against the uncontrolled release of radioactive or hazardous materials. In addition to operational parameters, there may also be SLs associated with administrative limits that procedurally control facility operations (manpower, inventory, configuration, status control, etc.).

SLs contain clearly stated actions which must be taken in the event that the TSR conditions are not met. Operation outside the SLs shall result in immediate shutdown of the equipment and systems and notification of applicable authorities (DOE, SCDHEC, EPA, etc.).

Application of the criteria and methodology described in Chapter 11 of the CIF SAR, which are based on DOE Order 5480.22, has resulted in the identification of no process variables that require SLs.

SECTION 3/4 - Limiting Control Settings, Limiting Conditions for Operation, and Surveillance Requirements**Limiting Control Settings And Limiting Conditions For Operation**

Limiting Control Settings (LCSs) are settings on safety systems that control process variables to prevent exceeding Safety Limits (SLs). Since no SLs were identified for inclusion in the TSR, no LCSs are required.

Limiting Conditions for Operation (LCOs) are limits established at the lowest functional capability or performance level of equipment required for safe operation of the FACILITY. LCOs are divided into groups according to the type of equipment or parameters concerned. For each LCO not met, certain required actions must be performed. There is a defined time interval in which the required actions must be completed. Unless otherwise stated, the required interval is based upon the time which the actions condition has been discovered (the same requirement applies to multiple actions for a condition).

Application of the criteria and methodology described in Chapter 11 of the CIF SAR, which are based on DOE Order 5480.22, has resulted in no systems, components, or parameters

being identified that require LCOs.

Surveillance Requirements

SRs ensure the conditions of the LCOs are met. Surveillance Requirements (SRs) relate to testing, calibration, or inspection of equipment or conditions to ensure that the necessary quality of systems and components is maintained. In addition, SRs ensure that FACILITY operations comply with the LCO. . The SRs for a given LCO are provided immediately following the actions portion of the LCO.

Since no LCOs were identified, no SRs are necessary.

SECTION 5 - Administrative Controls

1.09	DESCRIBE the following administrative controls of the CIF TSRs: <ul style="list-style-type: none">a. Minimum Shift Crew Compositionb. Procedures Applicability and Usagec. Inventory Control Programd. Occurrence Reportinge. Facility Operations Safety Committeef. Facility Operating Records
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The Administrative Controls Section specifies the administrative framework for safe operation of the Consolidated Incineration Facility (CIF). It also provides an overview of control documents and programs used to maintain safe operations.

The control documents and programs for the CIF are prescribed to ensure that basic and important decisions are made only after appropriate review and that decisions, which could significantly affect safety, receive independent review.

The major functions of the Savannah River Site (SRS) are assigned to divisions, each under the direction of a vice president. The vice presidents report directly to the Westinghouse Savannah River Company (WSRC) President. Within the Solid Waste and Environmental Restoration (SWER) Division, the CIF is managed by a FACILITY manager

Lines of authority, responsibility, and communication are defined and established for the highest management levels through intermediate levels and for the operating organization positions. These relationships are documented and updated, as appropriate, in the form of organization charts, functional descriptions of departmental responsibilities and relationships, job descriptions for key personnel positions, or in equivalent forms of documentation.

The individuals who train the operating staff, carry out health physics functions, or perform Quality Assurance (QA) functions may report to the FACILITY manager; however, these individuals shall have sufficient organizational freedom to ensure their independence from operating pressures.

Management Responsibilities

The FACILITY manager is responsible for the following items:

- Overall FACILITY operation and delegation in writing of the succession to this responsibility during his/her absence
- Operation of the FACILITY in accordance with approved TSRs
- Facilitation and control of physical changes in FACILITY configuration and coordination of the activities of all work groups within the FACILITY
- Ensuring that each on-duty shift is composed of at least the minimum shift crew composition shown in Table 3, *CIF Minimum Shift Crew Composition*
- ; any temporary deviation from these requirements must be justified by FACILITY-specific analysis and approved by DOE
- Ensuring that cognizant on-call support personnel are assigned and that technical support personnel are available to provide technical assistance to the operations staff
- Ensuring that all FACILITY operations are performed under the cognizance of a trained First-Line Supervisor (FLS) or higher
- Ensuring that FACILITY control is carried out by qualified operators according to written procedures
- Ensuring that FLSs and personnel involved in the movement of waste are subject to the following limitations when being assigned work outside of their regular schedules (these limits do not include time for shift turnover or safety/security meetings):
 - 16 consecutive hours
 - 24 hours in 48 hours
 - 72 hours in 7 days
 - 14 consecutive days without having 2 consecutive days off (a 24-hour break interrupts the consecutive-day sequence)

Any deviations from these overtime requirements is authorized on a case-by- case basis, in advance, by the FACILITY manager or designee. The approval must be documented and provide the basis for granting the deviation. Individual overtime is reviewed monthly by the FACILITY manager or designee to ensure that excessive hours have not been worked. If individuals are required to work in excess of 12 continuous hours, their duties should be carefully selected. FACILITY staff should not be assigned any task that could compromise safe operation of the FACILITY.

MODE	First-Line Supervisor	Operator	RC&HP Radiological Control & Health Physics	Maintenance
OPERATION	1	4	1	1
WARM	1	3	1	1

STANDBY				
SHUTDOWN	1	2	1	1
COLD STANDBY	1*	0	1	1

Table 3, CIF Minimum Shift Crew Composition

* May also support or be supported by other facilities

The FLS is responsible for the local command function of the FACILITY during OPERATION. The FACILITY manager shall notify all FACILITY personnel of this fact annually. During any unavailability of the FLS while the FACILITY is in OPERATION, a qualified individual may be designated to assume the command function.

System Of Control Documents

A formalized system of procedures is used to ensure that the CIF is operated and maintained as prescribed by the authorization basis documents (e.g., Safety Analysis Report [SAR], TSRs).

The authorization basis documents provide the requirements and bases for safe operation of the CIF. These documents, in turn, are implemented by lower-tier procedures and documents, which contain limits on variables and system operations that are at least as restrictive as those in the authorization basis documents.

The authorization basis documents are the primary safety control documents. The authorization basis for the CIF is described in WSRC-RP-94-546, *Authorization Basis Documents for Solid Waste Management Department*.

Contractual Agreement

The contract describes the relationship between the contractor (WSRC) and the contracting officer (DOE).

Safety Analysis Report

The SAR:

- Is prepared, independently reviewed, and approved in accordance with regulatory requirements
- Describes the CIF and its operation
- Documents the principal analyses made to determine that the CIF can be operated without undue risk to the public
- Identifies potential hazards and parameters affecting CIF safety
- Determines with reasonable assurance that the CIF has the capacity for preventing accidents or mitigating their effects sufficiently to preclude undue risks to public health and safety
- Provides technical information needed to define the boundary between acceptable and unacceptable conditions
- Is revised for significant changes in CIF design, system configuration, and operation in accordance with an approved procedure

Technical Safety Requirements

TSRs are prepared, independently reviewed, and approved in accordance with regulatory requirements. TSRs also define the controls necessary to ensure that the CIF remains within the safe operating envelope defined in the authorization basis documents. TSRs formally document the requirements in the following sections:

- Use and Application
- Safety Limits (SLs)
- Limiting Control Settings (LCSs), Limiting Conditions for Operation (LCOs), and Surveillance Requirements (SRs)
- Administrative Controls
- Bases

Since the TSRs for the CIF do not include SLs, LCSs, LCOs, or SRs, a TSR violation occurs if there is programmatic noncompliance or repeated neglect for observance of the Administrative Controls. The TSR requires the following actions to be taken in the event that a TSR violation occurs:

- Place the affected FACILITY or PROCESS AREA in a safe condition and restore the FACILITY or PROCESS AREA in accordance with an approved RESPONSE PLAN; Transfers or other movements of MATERIAL in the affected area is limited to those activities that are needed in order to eliminate an imminent threat of a radioactive or hazardous chemical release.
- Notify DOE of the TSR violation
- Review the matter and record the results of the review, including the cause of the condition and the basis for any corrective actions, to preclude reoccurrence

TSRs are complied with except for reasonable action taken in an emergency when this action is immediately needed to protect the public health and safety and when action consistent with the TSRs is not immediately apparent. TSRs are procedurally controlled to require that changes undergo the following administrative process:

- Prepared with a submittal package including a description of the revision, justification for the change, and supporting analyses
- Reviewed and approved by WSRC management
- Approved by DOE prior to incorporation of the TSR change

Unreviewed Safety Question (USQ) Process

The USQ process is used to allow greater flexibility for operation of the facility. The process allows contractors to make physical changes, procedural changes, experiments and tests to the process or facility without prior DOE approval as long as the changes do not affect the authorization basis or result in a TSR change. Proposed activities (including temporary modifications) are evaluated through the process. The evaluation results are reviewed, approved, and documented in accordance with an approved procedure. DOE Order 5480.21 sets forth the definition for determining the existence of an USQ.

The process first involves a screening criteria used to limit the number of proposed actions for which safety analyses must be written. The screening criteria, when properly used, should reduce the expenditure of resources on issues of minor safety importance. The first question in the screening is asked to determine if the proposed activity involves a change to the TSRs. If the change will modify TSRs, then a safety evaluation is required and no further screening is required. If the change will not modify TSRs, the screening process next asks if the activity will modify any authorization basis documents. If these documents will be modified, then a safety evaluation is required.

The safety evaluation of the process first addresses the increase in the probability of accident occurrence. The process asks about changes in accident frequency, consequences, equipment

malfunction, and accident types. The USQ next deals with the margin of safety as defined in the safety analysis. The TSRs set forth the minimum acceptable level of performance and operation under normal and specified failure conditions. If the safety margins are not specifically addressed in the TSRs, the change needs to be reviewed to determine if it will result in a reduction in the margin of safety. Sometimes the margins are implied, not a specific parameter or value. The determination of the changes overall effect, however, needs to be based upon a physical parameter or condition.

The entire USQ process is outlined in DOE Order 5480.21 DOE approval is required prior to implementation of a proposed activity when the activity is determined to be a USQ.

Authorization of FACILITY OPERATION by DOE

DOE approval is required prior to OPERATION if the FACILITY has been in COLD STANDBY as a result of any of the following situations:

- A DOE-mandated shutdown
- Discovery of a condition that results in a USQ
- Being in COLD STANDBY in excess of 12 months

Procedures

Procedural activities are as follows:

- Procedures are established, implemented, and maintained to address the activities specified in Table 4, *Procedural Activities*.
- Procedures are reviewed and approved to be in conformance with the following:
 - Procedures are approved by appropriate management levels in accordance with approved procedures.
 - New procedures and procedure changes are evaluated by the USQ
 - Temporary procedure changes are allowed in accordance with an established program.

A.	Procedures to govern the administrative aspects of operation
B.	Operating procedures to govern:
	1. Startup, operation, and shutdown of FACILITY systems and equipment
	2. Surveillance requirements
C.	Emergency and abnormal operating procedures to define the methods for correcting abnormal conditions
D	Implementation of the CIF emergency response program, Emergency Preparedness Administrative Procedures (EPAPs), and Emergency Plan Implementing Procedures (EPIPs)
E	Implementation of the fire protection program
F	Implementation of the configuration control program
G	Implementation of the environmental compliance program
H	Implementation of facility-specific controls
I	Implementation of the radiation protection program
J	Implementation of the QA program

Table 4, Procedural Activities

Special Procedures

Special Procedures provide instructions and limits for special operations and are:

- Approved by appropriate management levels in accordance with approved procedures that have been authorized by the FACILITY manager or designee (other disciplines may be required to review and approve a Special Procedure based on the subject matter)
- Evaluated by the USQ process
- Limited in life
- Do not allow operation outside the TSR

Area Emergency Plan

The Area Emergency Plan defines specific measures, policies, and actions to prevent or minimize injuries, damage to property, and impact on the environment caused by accidents, natural disasters, or deliberate damage within the area of responsibility. The FACILITY manager ensures that an emergency preparedness program is established in accordance with applicable DOE Orders, based on formal hazards assessment and requirements. The program contains the following elements at a minimum:

- Emergency response organization
- Operational emergency event classes
- Notification
- Consequence assessment
- Protective actions
- Medical support
- Recovery and reentry
- Emergency equipment
- Training
- Drills and exercises
- Program administration

Fire Protection Program

A fire protection program is established to minimize the following:

- Threats to the public health or welfare resulting from a fire
- Undue hazards to site personnel from a fire

The fire protection program addresses the following elements and implements them as required:

- Fire Prevention
 - Fire-resistive construction
 - Control of combustibles
 - Control of ignition sources
 - FACILITY inspections
 - Handling of combustible/flammable liquids and gases

- Fire Control
 - Automatic detection/suppression and alarm systems
 - Fire Watch (as necessary); if a fire detector or alarm is found inoperable, a Fire Patrol inspects the affected fire detection zone within 4 hours of discovery, monitors and provides backup suppression as necessary.
 - Adequate fire barriers (e.g., walls, doors, dampers)
 - Proper availability and maintenance of firefighting equipment
 - Identification of firefighting personnel, responsibilities, and training
 - 24-hour firefighting coverage
 - Proper fire control pre-plans that adequately cover manual firefighting methods, address possible emergency conditions during firefighting, and identify special hazards within the FACILITY

Configuration Control Program

A configuration control program is implemented and meets the following requirements:

- Identification and documentation of the technical baseline of structures, systems, components, and computer software
- Ensures changes to the technical baseline are properly developed, assessed, approved, issued, and implemented through the use of the following elements:
 - Change Control Review Boards
 - Setpoint control and interlock control
 - Design control
 - Software control
 - Technical review and approval process, including performance of a USQ process and review of environmental documentation
 - Document control
 - Verification and acceptance process
 - Compliance auditing
 - Temporary modification control
 - Work control
- Maintains a system for recording, safeguarding, and indicating the status of technical baseline documentation on a current basis

Environmental Compliance Program

The environmental compliance program ensures FACILITY compliance with all applicable federal and state environmental regulations.

Facility-Specific Controls

Inventory Control Program (ICP)

The CIF Inventory Control Program (ICP) is a formal, documented administrative system that defines and controls the requirements for liquid and solid, low-level, hazardous, and mixed waste received by the CIF. The ICP ensures that the following specific CIF inventory controls are adhered to:

- The total radiological inventory in a FACILITY SEGMENT shall be less than the quantity that would result in a maximum individual radiological dose at 100 meters, due to a 2-hour exposure to any accident, of 4 rem Effective Dose Equivalent (EDE).
- The total non-radiological inventory in a FACILITY SEGMENT shall be less than the quantity that would result in a maximum individual non-radiological dose at 100 meters, due to a 30- minute exposure to any accident, of the Emergency Response Planning Guideline (ERPG)-2 or the Immediately Dangerous to Life and Health (IDLH) values.
- The total inventory of carcinogenic chemicals in a FACILITY SEGMENT shall be less than the quantity that would result in a maximum increase in individual Incremental Cancer Risk (ICR) at 100 meters, due to a 30-minute exposure to any accident, of 2.5E-04 ICR.
- The total mass of fissile MATERIAL accumulated at the CIF shall be limited to 624 grams of equivalent U-235 to ensure that criticality is not a credible event for the life of the FACILITY.
- The number of fissile MATERIAL cleanouts credited with the removal of fissile MATERIAL shall be limited to four per year.

The ICP is implemented using computer software that is maintained in accordance with applicable site requirements. The ICP requires that a manifest accompany waste containers shipped to the CIF, documenting the waste generator's adherence to the CIF Waste Acceptance Criteria (WAC) and including information to allow calculation of the isotopic and hazardous chemical content of the waste shipment based on the generator's waste stream characterization. (NOTE: The ICP is dependent on the WAC, which contain limits and requirements for the waste generators that send waste to the CIF.).

The ICP also requires that waste not in compliance with the ICP, or suspect waste, be brought into compliance or rejected. Rejected waste is returned to the waste generator, or an approved alternate. Compliance with the ICP is crucial to ensure that the facility categorization, per DOE Order 1027, remains as a Radiological Facility instead of a Nuclear Facility.

Radiation Protection Program

The radiation protection program is conducted such that the radiation exposures of WSRC employees, DOE personnel, subcontractors, visitors, and members of the general public are controlled to levels that do not exceed applicable DOE limits and that are As Low As Reasonably Achievable (ALARA). The radiation protection program ensures that the following policies are implemented:

- Individual and collective radiation exposures will be minimized through the following:
 - ALARA program
 - Radiation Work Permit (RWP)
 - Radiological training
- Radioactive contamination of personnel, areas, and equipment is minimized through the following:
 - Radioactive surface and airborne contamination controls
 - Radioactive material controls
 - Radioactive effluent controls

Quality Assurance Program

Refer to Chapter 12 of the CIF SAR for a description of the QA program.

Response Plans

The purpose of a RESPONSE PLAN is to ensure that additional analysis or administrative and management controls are in place when an abnormal situation arises and the FACILITY or PROCESS AREA is outside of normal operating conditions defined by the TSR. A RESPONSE PLAN has two functions.

- The first function is to restore the FACILITY or PROCESS AREA to a safe condition.
- The second function is to determine what further actions are required to ensure that the FACILITY or PROCESS AREA is operating within the framework of the TSRs.

Actions specified in a RESPONSE PLAN may include, but are not limited to, FACILITY cleanouts (partial or full) and the return of waste to waste generators. Completion times for actions specified in a RESPONSE PLAN depend on the conditions that exist at the time that the plan is put into effect and are based primarily on safety considerations. RESPONSE PLANS are intended to provide operations personnel with the direction needed to safely accomplish a stated endpoint; however, these plans do not prohibit reliance upon operator training and experience in the correction of the condition. RESPONSE PLANS are approved by the FACILITY manager or designee prior to implementation.

Events, Conditions, and Concerns Investigations and Occurrence Reporting

Events and conditions that may involve safety, health, quality, safeguards, security, or environmental implications are controlled by WSRC policy. It is the policy of WSRC to encourage a positive attitude toward reporting occurrences and that occurrences be consistently reported to ensure that both DOE and WSRC line management, including the Office of the Secretary, are kept fully and currently informed of all events that could (1) affect the health and safety of the public, (2) seriously impact the intended purpose of DOE facilities, (3) have a noticeable adverse effect on the environment, or (4) endanger the health and safety of workers. Furthermore, the policy of WSRC requires a systematic process for determining appropriate corrective action and for ensuring that such action is effectively taken. Specifically, it is WSRC policy to ensure the following:

- Timely identification, categorization, notification, and reporting to DOE and contractor management of all Reportable Occurrences at DOE-owned or -operated facilities
- Timely evaluation and implementation of appropriate corrective actions
- Maintenance of a central DOE operational database containing all occurrence reports (if the computerized DOE operational database is being used)
- Review of Reportable Occurrences to assess significance, root causes, generic implications, and the need for corrective action
- Dissemination of occurrence reports to DOE operations and facilities to prevent similar occurrences

Occurrence reports are required to be approved by WSRC line management. Some CIF Occurrence Reports are identified and discussed further in the Lessons Learned section of this guide.

Additional Facility Specific Controls

The CIF has the following additional controls based on commitments made in the SAR:

- Maintenance is not performed on the diesel generators while solid waste is being incinerated
- Doors between the unloading dock and box handling area are closed when a loaded truck is parked at the dock but is not being unloaded
- Doors between the unloading dock and box handling area are closed in the event of a fire in the process building
- Reject box storage area is inspected daily for leaking boxes

Review And Audit

This section describes the methods established to conduct independent reviews and audits. These methods include creating an organizational unit (such as a standing or ad hoc committee), or assigning individuals capable of conducting these reviews. When an individual performs a review function, a cross-disciplinary review determination may be necessary. Individual reviewers shall not review their own work or work for which they have direct responsibility. Management shall specify the functions, organizational arrangement, responsibilities, appropriate qualifications of reviewers, and reporting requirements of each functional element or unit that contributes to these processes.

The review and audit program provides senior-level FACILITY management with an assessment of FACILITY operation and recommendations to improve nuclear safety and FACILITY reliability. The program includes an assessment of the effectiveness of reviews conducted by FACILITY staff. The goal of the independent audit program is to verify compliance with established WSRC policies and programs.

Reviews

Facility Operations Safety Committee

The Facility Operations Safety Committee (FOSC) advises the FACILITY manager on matters affecting the operation of the FACILITY and associated activities affecting safety. The FOSC reviews the day-to-day activities to ensure that they are conducted in a safe manner. This review program includes, as a minimum, the following elements:

- USQs
- Proposed tests and experiments
- Procedures
- Programs
- FACILITY changes and modifications
- TSR changes
- FACILITY operation
- Maintenance and testing
- DOE and industry issues for potential generic safety significance
- Other safety-related issues

Information on FOSC activities shall be provided to the FACILITY manager and the Division Independent Safety Review Committee (DISRC).

Committee members possess sufficient education, experience, expertise, and safety analysis and technical training to undertake the reviews and evaluations that the committee is intended to perform.

Division Independent Safety Review Committee

The DISRC reports to and advises the Vice President and General manager, SWER Division, on the areas addressed by the review program. The DISRC has expertise in those areas and provides an independent review and assessment of FACILITY operation components, with recommendations to improve safety and reliability. The DISRC reviews FACILITY activities to ensure that they are conducted in a safe manner. This review program includes review of the following elements:

- USQs
- Proposed changes to the TSR
- Violations of codes, orders, and procedures that are significant to safety
- Occurrence reports
- Staff performance
- Unanticipated deficiencies of structures, systems, or components that could affect nuclear safety
- Significant unplanned radiological or toxic MATERIAL releases
- Significant operating abnormalities

Committee members possess sufficient education, experience, expertise, and safety analysis and technical training to undertake the reviews and evaluations that the committee is intended to perform.

Audits

An audit program is established and conducted by a group independent of the FACILITY, normally the Environmental, Safety, Health, and Quality Assurance (ESH&QA) Division. The program ensures the FACILITY is being operated in accordance with the TSR and other DOE guidance. This audit program includes the following elements:

- Conformance with the TSR
- Training and qualifications of the FACILITY staff
- Program implementation
- Effectiveness of corrective actions
- Quality program adherence
- Other activities of safety significance

Qualifications And Training

Qualifications

A program is established to ensure that appropriate personnel meet established qualification requirements for their positions.

Training

Personnel receive initial training in the safety aspects of jobs with periodic retraining in identified areas. Personnel shall also receive training in emergency actions as described in area and site emergency plans and procedures. Personnel involved in operations affecting nuclear safety are trained in their tasks prior to assuming the responsibilities of the position. Training requirements are detailed in accordance with administrative procedures.

Initial training, continuing training, and retraining of qualified supervisors and operators are carried out by formal classroom instruction and on-the-job training. Initial operator qualification is based on a demonstrated acceptable level of competence and performance. Initial operator qualification depends on satisfactory completion of the qualifications as defined in the FACILITY program description.

Performance-based training is used for designing and implementing training. Continuing training and reexamination on emergency response procedures are conducted annually, and biennially for other procedures important to safe operation. Requalification is conducted biennially. Retraining includes familiarization with relevant industry operating experience as appropriate. The bases for both initial qualification and requalification are documented. Documentation includes a copy of the most recent test results and grades.

Facility Operating Records

Records retention practices are in accordance with the SRS QA program and Records Management Directive. Specifically, the following documents are retained as records for the period specified by the organization's Record Retention Schedule:

- Records and logs of FACILITY operation
- Records and logs of principal maintenance activities, inspections, repairs, and replacements of principal items of equipment related to nuclear safety
- All reportable events and occurrences
- Records of surveillance activities, inspections, and calibrations required by TSRs and any non-conforming conditions encountered
- Records of changes made to procedures
- Records and drawing changes reflecting FACILITY design modifications made to systems and equipment described in the authorization basis documents
- Records of radiation exposure for all individuals entering Radiological Buffer Areas (RBAs)
- Records of gaseous and liquid radioactive MATERIAL released to the environment
- Records of FACILITY tests and experiments
- Records of training and qualification for current members of the FACILITY operations staff
- Records of evaluations for the USQ process performed for changes made to procedures or equipment or for tests and experiments
- Results of reviews and assessments

Bases

Since no safety limits, limiting control settings, limiting conditions for operation, or surveillance requirements were identified for the CIF, a bases section is not required.

SAR AND TSR REVISIONS

Introduction

Per the requirements of DOE Standard 1027, the facility is being reclassified (categorized) from a Nuclear Facility to a Radiological Facility. The reclassification was based upon evaluation of the inventories of waste to be processed and the limits on the contents of the waste streams per Manual 1S, Procedure 3.13, *CIF Waste Acceptance Criteria*.

Auditable Safety Analysis (ASA)

1.10	DESCRIBE the Auditable Safety Analysis (ASA) to be used at CIF.
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The effect of the reclassification will be that the safety analysis documentation will be less detailed and reduced in size. The safety analysis material will be presented in the form of an Auditable Safety Analysis (ASA). The ASA will contain similar material to that outlined in the SAR to include the following:

- Chapter 1 - Introduction and General Objectives
- Chapter 2 - Accident Analysis and Potential Impact of Operations on Safety and health of the Public and Operating Personnel
- Chapter 3 - Site Location and Characteristics
- Chapter 4 - Facility, Waste Characteristics, Design Bases, and Process Systems and Components
- Chapter 5 - Accident Scenario Analysis of Postulated Accidents
- Chapter 6 - Quality Assurance
- Chapter 7 - Conduct of Operations
- Chapter 8 - Limiting Conditions
- Various appendices are also provided for information and reference.

The reclassification of the facility allows us to present safety analysis materials in this easy to use and more manageable document. Personnel need to be aware that the largest factor associated with the classification of CIF as a Radiological Facility is Facility-Specific Controls, the Inventory Control Program in particular. As long as we maintain the stored and processing waste inventories at or below the required levels per the DOE standards, we maintain operation within our design basis safety envelope.

Process Requirements (PRs)

PRs will be similar to SLs, LCSs and LCOs in appearance and content. Six administrative areas will have designated PRs based upon classifications that are procedurally administered. The six areas are identified as:

- Inventory Control Program
- Flammability Control and Monitoring
- Criticality Control
- Level/Leak Containment
- Environmental Emissions
- Operations Controls

Each PR will be identified with applicable references, a Process Condition for Operation (PCO), the implementing documentation (if applicable), and, if the implementing documentation is applicable, a procedure number.

Table 5, *PCO/LCO Comparison*, shows how the PRs will address requirements in a similar manner to the technical specifications used in site reactors.

Safety Limit	LCS	Bases	LCO	SR	Rounds Surveillance
Process Requirement	Requirement	Reference	PCO	Implementing Document	Procedure

Table 5, PCO/LCO Comparison

Process requirements are not necessarily written for structures, systems or components on a one-to-one basis. Some draft PRs are shown in Figure 3, *Implementation Matrix*.




Figure 3, Implementation Matrix

LESSONS LEARNED

Introduction

The following is an example of how SAR compliance issues and requirements can effect facility operations.

LACK OF IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORT REQUIREMENTS

On June 23, 1994, the Safety Analysis Report and Operational Safety Requirements (SAR/OSR) for the Idaho Mixed Waste Storage Facility was approved without procedures clearly identifying how the requirements of the revised SAR/OSR were to be implemented. This resulted in some confusion and the potential for inadequate monitoring of personnel entries into the basement area of the mixed waste storage facility. (ORPS Report ID--EGG-WROC-1994-0001)

Site personnel reported that there was no clearly defined program in place to implement the requirements of the SAR/OSR for the day-to-day activities of the facility. In a specific example, there was no direct procedural guidance for a requirement that "trained personnel will verify the basement atmosphere to be safe using fixed or portable monitoring equipment before personnel are permitted to enter the basement of the waste storage facility and once each hour when the basement is occupied." The basement contains non-ignitable mixed waste in closed containers. By July 14, 1994, operating procedures and RWPs were revised to take credit for the Continuous Air Monitor and the Remote Air Monitor located in the basement of the facility.

Site personnel were unable to determine how the hourly verification by trained personnel was being addressed. They indicated that there was no hourly test for toxic airborne constituents, although it is generally believed that radiological airborne contamination would appear before toxic contamination. At this time, an Industrial Hygienist surveys the basement of the mixed waste storage facility on a monthly basis for toxic contamination.

Although there was no impact on facility workers or the general public, entry control requirements of the SAR/OSR for controlled areas containing both radioactive and toxic material were not implemented. The primary concern is the approval of the SAR/OSR without supporting procedures in place. Facility personnel indicated that there was a need for a program to assure that Safety Analysis requirements are made operational on a timely basis.

A search of ORPS and OEWS data bases for implementation of Safety Analysis requirements yielded numerous occurrences that involve the inadequate implementation of upgraded SAR requirements.

The significance of this occurrence is the potential for facility personnel to overlook the implementation of a major safety analysis requirement, which could have result in serious consequences to the health and safety of the general public.

Order DOE 5481.1B, Safety Analysis and Review System, provides guidance for the implementation of actions to be taken as a result of SAR upgrade. DOE 5480.23, Nuclear Safety Analysis Reports, addresses implementation requirements.

Occurrence Reports

Occurrence reports are used to document events that happened associated with operation outside of the authorization basis requirements. The reports provide the following information:

- time and place of the event
- type or classification of the event
- system, building or equipment associated with the event
- notifications made
- a narrative description
- operating mode
- actions taken and results
- causes
- evaluations
- corrective actions taken by the facility to prevent re-occurrence
- impact on the environment, safety and health
- impact on the facility design and/or development
- impact upon codes and standards
- lessons learned
- additional reviewer input and approval

GLOSSARY

ALARA As Low As Reasonably Achievable

CIF Consolidated Incineration Facility

DISRC Division Independent Safety Review Committee

DOE Department of Energy

DRE Destruction and Removal Efficiency

DWPF Defense Waste Processing Facility

EDE Effective Dose Equivalent

EPAP Emergency Preparedness Administrative Procedure

EPIP Emergency Plan Implementing Procedure

ERPG Emergency Response Planning Guideline

ESH&QA Environmental, Safety, Health, and Quality Assurance

FLS First-Line Supervisor

FOSC Facility Operations Safety Committee

ICP Inventory Control Program

ICR Incremental Cancer Risk

IDLH Immediately Dangerous to Life and Health

LCO Limiting Condition for Operation

LCS Limiting Control Setting

OWTL Organic Waste Transfer Line

QA Quality Assurance

RBA Radiological Buffer Area

RC&HP Radiological Control and Health Physics

RWP Radiation Work Permit

SAR Safety Analysis Report

SL Safety Limit

SR Surveillance Requirement

SRS Savannah River Site

SWER Solid Waste and Environmental Restoration

TSR Technical Safety Requirement

USQ Unreviewed Safety Question

WAC Waste Acceptance Criteria

WSRC Westinghouse Savannah River Company